Publication No. TG 3053-1
Sept. 1995

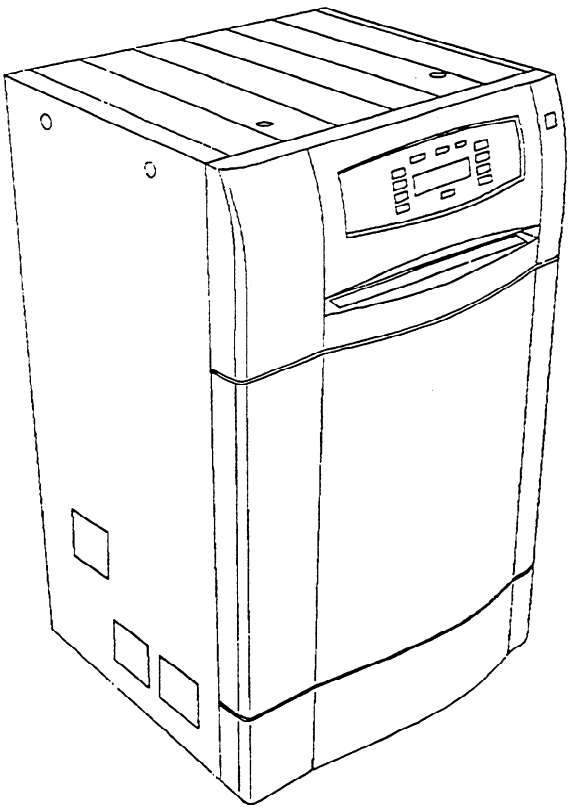
SUPPLEMENT to the THEORY GUIDE

for the

KODAK MULTILOADER *700*

to include the

KODAK MULTILOADER 700 PLUS



© KODAK AG STUTTGART, 1995

PLEASE NOTE

The information contained herein is based on the experience and knowledge relating to the subject matter gained by Kodak prior to publication.No patent license is granted by this information. Kodak reserves the right to change this information without notice, and makes no warranty, express or implied, with respect to this information. Kodak shall not be liable for any loss or damage, including consequential or special damages, resulting from the use of this information, even if loss or damage is caused by Kodak's negligence or other fault.

TABLE OF CONTENTS ..... PAGE

DOUBLE FILM SENSOR B14 DFS 1-1

TUNNEL SENSOR REAR / FRONT (TSR / TSF) 1-2

SENSOR TSF B8 1-2

SENSOR TSR B7 1-2

JUMPER X14 PCB A9 1-4

JUMPER X15 PCB A9 1-5

NOTE

This supplement contains only information describing the differences between the KODAK MULTILOADER 700 and the KODAK MULTILOADER 700 PLUS. Information common for both units is described in the THEORY GUIDE TG 3053.

DOUBLE FILM SENSOR B14 DFS

The DOUBLE FILM SENSOR of the ML700 measures the transparency of the FILMS. The DOUBLE FILM SENSOR of the ML700PLUS, however, measures the thickness of the FILMS.

If there is no FILM between the DETECTOR ROLLERS the path of light in SENSOR B14 is interrupted by AREA 1 of the DOUBLE FILM SENSOR ARM.

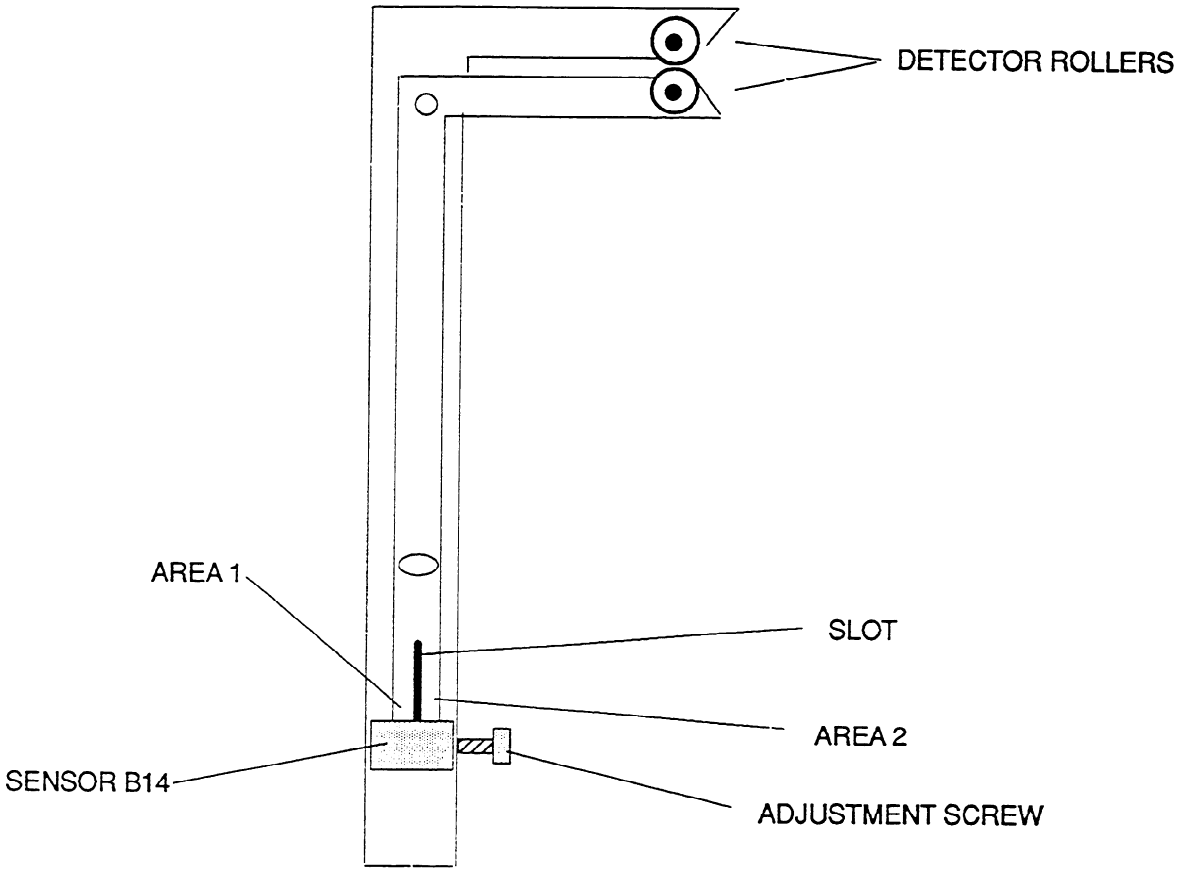


figure 1-1

If there are 2 or more FILMS between the DETECTOR ROLLERS the path of light in SENSOR B14 is interrupted by AREA 2 of the DOUBLE FILM SENSOR ARM.

If there is 1 FILM between the DETECTOR ROLLERS the light passes through the SLOT in the DOUBLE FILM SENSOR ARM.

The purpose of adjustment is to centre the SLOT of the DOUBLE FILM SENSOR ARM precisely over the LIGHT BEAM of SENSOR B14 if there is 1 FILM between the DETECTOR ROLLERS. To adjust it the position of SENSOR B14 can be changed with the ADJUSTMENT SCREW.

TUNNEL SENSOR REAR / FRONT (TSR / TSF)

To allow the use of INFRARED FILMS, SENSORS TSR B7 and TSF B8 are replaced. The ML700 version reacts on interrupting the light pass between TRANSMITTER and RECEIVER. The ML700 PLUS version reacts on reflected SENSOR LIGHT at the film surface. In addition, to minimize the danger of film fogging, the SENSORS are pulsed.

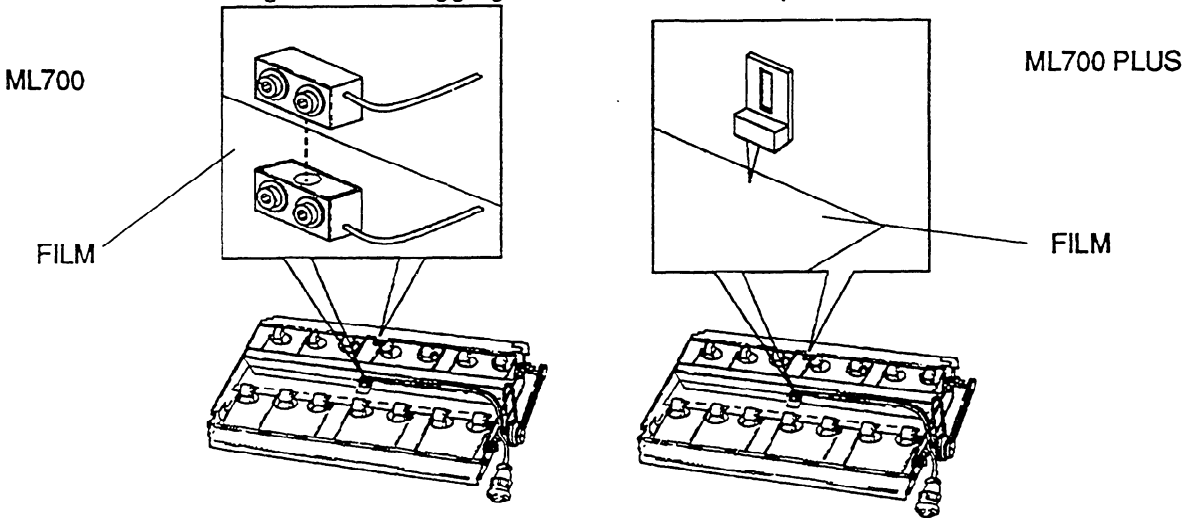


figure 1-2

The pulses are generated by IC U6 (timer NE 555) on PCB A9.

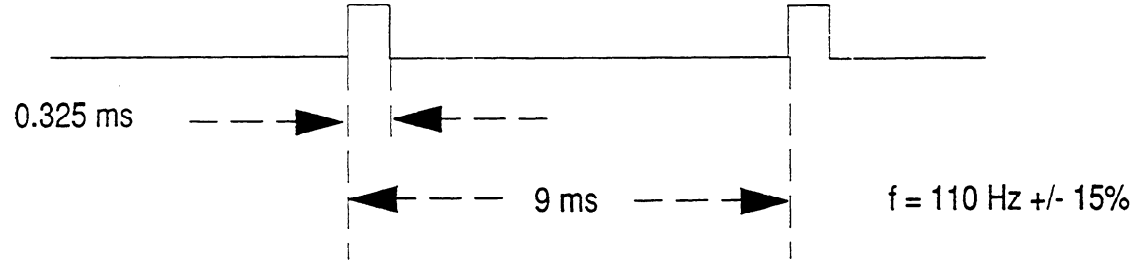


figure 1-3

SENSOR TSF B8

If a FILM is below SENSOR TSF the infrared pulsed are reflected by the FILM. The emiiter of B8 goes HIGH and the output of OP. AMP U4 (pin 1) goes LOW. This signal is an analog one. It is converted by the COMPARATOR U7 to digital. The COMPARATOR output controlls the input of FLIP FLOP U5. The output of U5 (pin 4) goes LOW for 15 msec. As the SENSOR PULSES occur every 9 msec the output of U5 will stay LOW as long as there is a FILM below SENSOR B8.

SENSOR TSR B7

Up to the output PIN 12 of U5 the function of SENSOR B7 is the same as of SENSOR B8. Because of the large variety of PROCESSORS with different speed which can be attached to the ML700 PLUS an "adjustable DELAY TIMER" is connected to PIN 12 of U5. This timer is needed to ensure that the trailing edge of the FILM is fully in the PROCESSOR prior to unloading of the next CASSETTE. Different DELAY TIMES are needed due to the different PROCESSOR TRANSPORT SPEEDS.

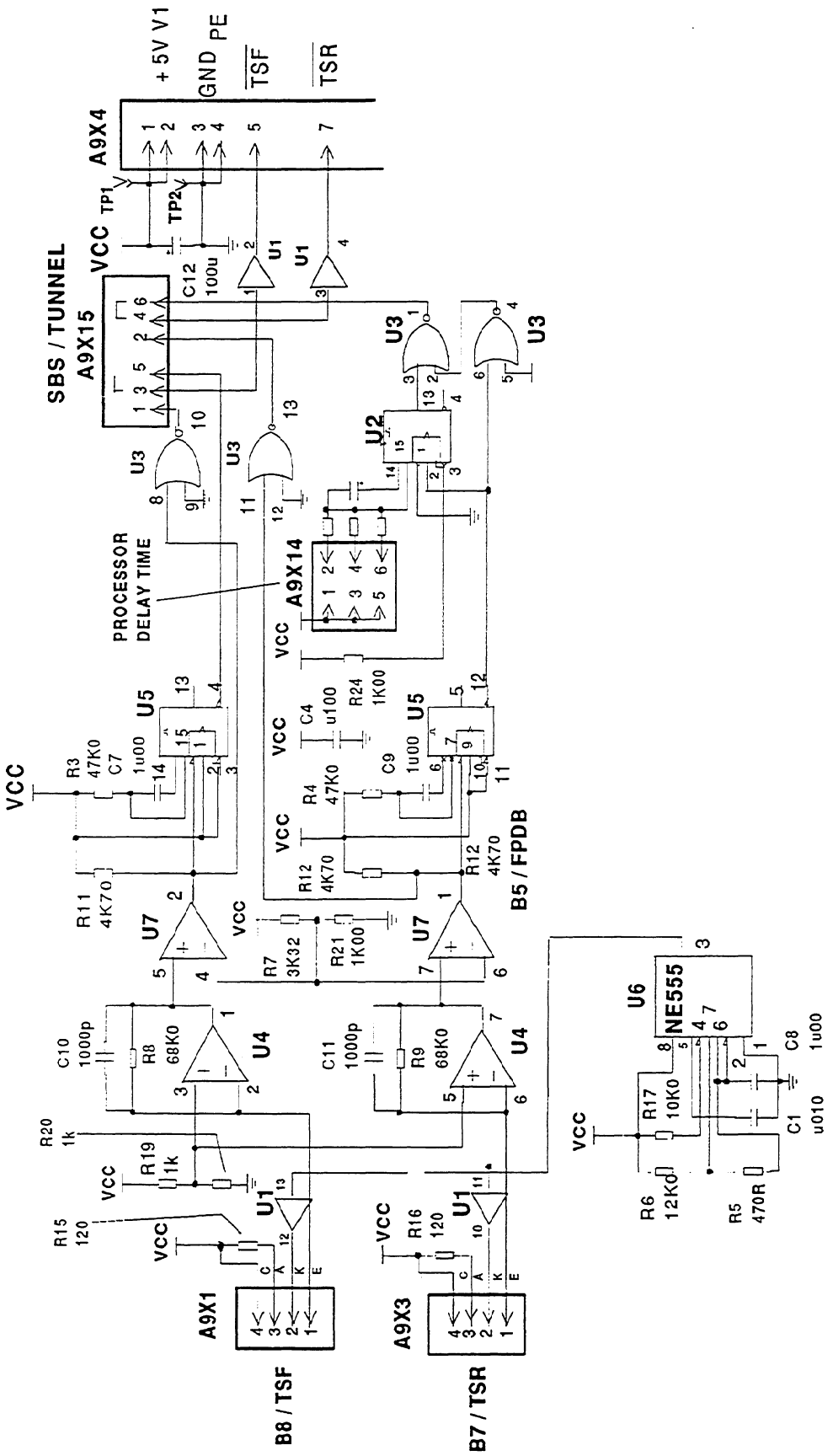

+ 5V V1
GND
PE
TSF
TSR
A9X4
SBS / TUNNEL
A9X15
VCC
TP1
TP2
C12
100u
U1
U3
U2
PROCESSOR
DELAY TIME
A9X14
U5
U7
U4
U6
NE555
R3
47K0
C7
1u00
R4
47K0
C9
1u00
C4
u100
R24
1K00
R11
4K70
R12
4K70
R7
3K32
R21
1K00
C10
1000p
R8
68K0
C11
1000p
R9
68K0
R20
1k
R19
1k
R15
120
R16
120
R17
10K0
R6
12K0
R5
470R
C1
u010
C8
1u00
A9X1
A9X3
B8 / TSF
B7 / TSR
B5 / FPDB

figure 1-4

For the timing of this DELAY TIMERS see the following TIMING DIAGRAMM.

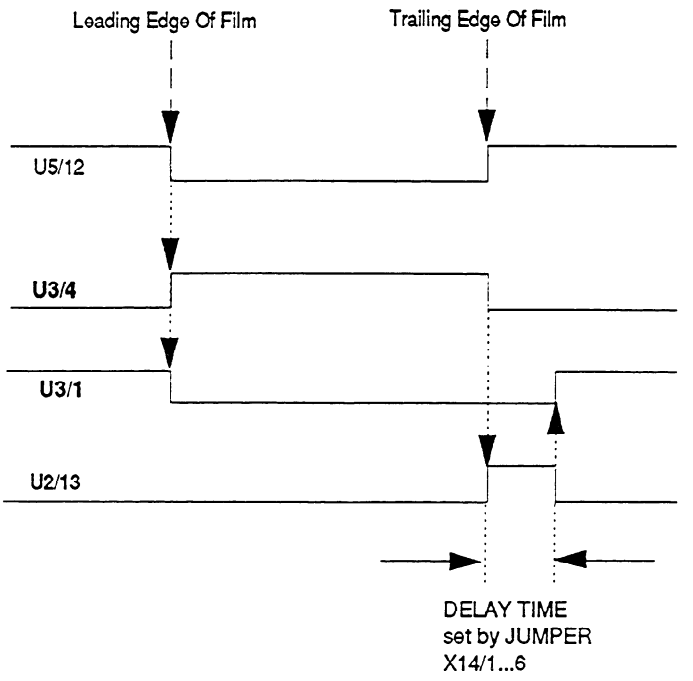


figure 1-5

JUMPER X14 PCB A9

Jumper X14 has to be set to the correct PROCESSOR SPEED.

A9X14	**PROCESSOR SPEED**	**CYCLE / PROCESSOR**	**DELAY TIME**
1-2	38.0 - 83 cm/min 15 - 32.6 in/min	minimum Speed for RA Processors	25.4 sec
3-4	83.1-132.5 cm/min 32.7 - 52.1 in/min	EXTENDED / ME3	6.2 sec
5-6	> 132.5 cm/min >52.1 in/min	STANDARD / M8	0.23 sec

The JUMPER SETTING depends on the PROCESSOR TRANSPORT SPEED. The DELAY TIME allows to transport the FILM fully into the PROCESSOR before the FILM is picked up from the next CASSETTE.

JUMPER X15 PCB A9

The purpose of JUMPER X15 is to decide between ML700 PLUS with TUNNEL and the ML700 PLUS with SBS.

If the ML700 PLUS is set up with a SIDE-BY-SIDE SYSTEM the TUNNEL SENSORS TSR/TSF are not available. These SENSORS are simulated by the SBS-Software. For this reason the DELAY TIMER U2 and the FLIP FLOP U5 on PCB A9 are bypassed with JUMPERS A9X15 1-3 and A9X15 2-4.

SIDE-BY-SIDE	**TUNNEL**
A9X15 1-3	A9X15 3-5
A9X15 2-4	A9X15 4-6

PCB A4 PLUS

A different FRONT DOOR SOLENOID is used in the ML700 PLUS. This SOLENOID draws much more current than the one from the ML700. If a PCB A4 from the ML700 is used in a ML700 PLUS, the SOLENOID DRIVER may fail immediately. The DOOR SOLENOID of the ML700 PLUS is controlled by a pulse of approx. 1 sec length. This pulse is generated on PCB A4 PLUS. It is a hardware function, not a software function!.

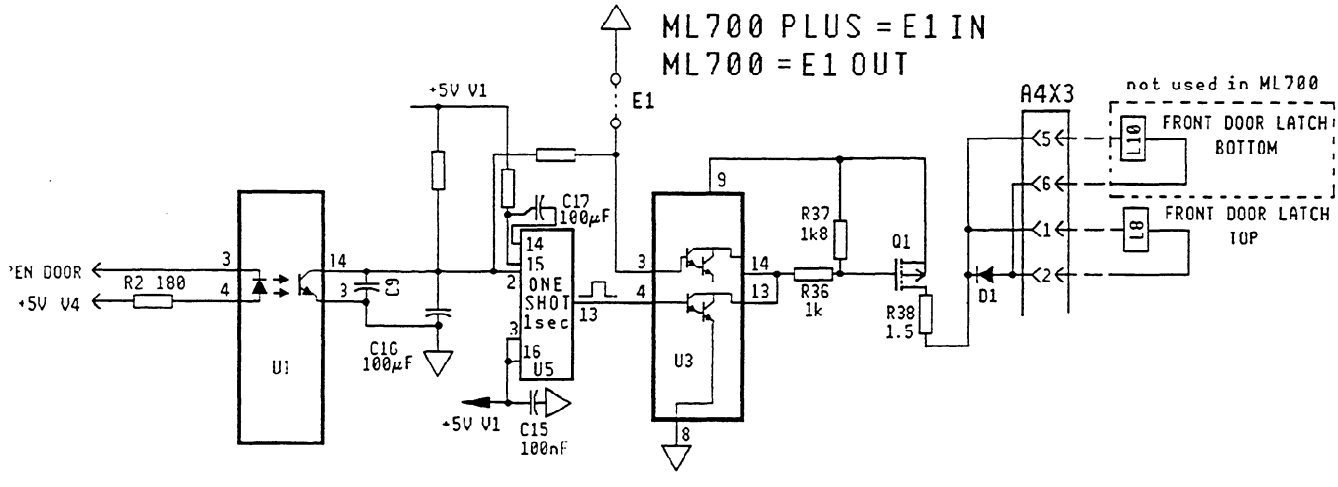


figure 1-6

FUNCTIONAL DESCRIPTION

During power up capacitor C16 is still discharged and pulls the input of ONE SHOT U5 to ground. This inhibits the FRONT DOOR SOLENOID during power up.

The FRONT DOOR can only be opened if the DOOR RELEASE BUTTON at the OPERATORS CONTROL PANEL is pressed. The MASTER PROCESSOR BOARD A0 sends the OPEN DOOR SIGNAL to PCB A4. This signal passes through the OPTP ISOLATOR U1 and triggers the ONE SHOT U5. Its output passes through U3. Pins 13/14 of U3 control the POWER AMPLIFIER Q1. Its output drives the FRONT DOOR SOLENOID. The FRONT DOOR pops open. After a second the FRONT DOOR SOLENOID is deenergised.

If this PCB is installed in a ML700 the JUMPER E1 must be out. If now OPEN DOOR becomes active the ONE SHOT U3 is started like befor, however its output is bypassed via pin 3 of U3. In this case the ML700 FRONT DOOR SOLENOIDS are energised as long as OPEN DOOR is active.

CUSTOMER EQUIPMENT SERVICES KODAK AG STUTTGART